IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial Number: 10/083,095
Filing Date: 02/26/2002
Applicant: Carberry
Title: Network Healing Smart Fiber Optic Switch
Docket Number: 26308.01
Examiner: Alessandro Amari
Art Unit: 2872
Customer Number: 22465
Declarant: Reddy Urimindi

DECLARATION OF REDDY URIMINDI UNDER 37 C.F.R. § 1.132

1. I, Reddy Urimindi, declare as follows, under penalty of perjury.

2. I hold a Ph.D. from Southern Methodist University, Dallas, Texas, awarded in 1993. I hold an MBA in Corporate Finance from University of Dallas, Texas. I hold an M.Tech in Electrical Engineering/Laser Technology from Indian Institute of Technology, Kanpur, India. I hold a B.Tech in Electrical Engineering from Nagarjuna University, India.

3. My position at Neptec Optical Solutions, Inc. at Richardson, Texas, is Vice-President of Marketing and Product Management. Since 1993 I have worked with various telecommunications and networking companies, including Lucent Technologies and Worldcom (formerly MCI). During my employment I have developed switch applications and worked with customer requirements. I am the inventor of four patents relating to fiber optics and optical networks. I am a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

4. I have reviewed Application Serial Number 10/083,095, filed on 02/26/2002, and titled "Network Healing Smart Fiber Optic Switch."

5. I have reviewed United States Patent Number 5,710,846, titled "Self-calibrating optical fiber switch," and issued to Wayman, et al., on January 20, 1998 (Wayman).

6. I have reviewed United States Patent Number 6,243,511, titled "System and method for determining the condition of an optical signal," and issued to Laughlin on June 5, 2001 (Laughlin).

7. I have reviewed United States Patent Number 5,028,824, titled "Programmable delay circuit," and issued to Young on July 2, 1991 (Young).

8. Among the optical devices with which I was familiar prior to the filing date of Application Serial Number 10/083,095, were devices of the type shown in the patents listed in paragraphs 5 and 6.

9. Examiner's Statement Regarding Claims 1, 6, and 7

10. I have reviewed the U.S. Patent and Trademark Office Action, Paper Number 02112004, which contains the following statement on page 4 with respect to Claims 1, 6, and 7:

> In regard to claim 1, Laughlin does teach (see Figures 1, 2) an analog selection circuit (62, 64) and that said switch responsive to said analog selection circuit as described in column 4, lines 21-65 and furthermore that the analog selection circuit is an art-recognized equivalent of an digital selection circuit.
>
> Regarding claim 6, Laughlin teaches said analog selection circuit is responsive to an optical signal strength of said primary optical signal and is responsive to an optical signal strength of said secondary optical signal as described in column 4, lines 22-56.
>
> Regarding claim 7, Laughlin teaches that said analog selection circuit includes a means for routing said secondary optical signal after said primary optical signal becomes invalid; a means for determining whether said primary optical signal has been valid for a selected period; and a means for deselecting said secondary optical signal and routing said primary optical signal through said optical switch as described in column 4, lines 22-65.

> It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the analog selection circuit as described by Laughlin in the device of Wayman et al in order to provide for a lower cost approach for the selection circuit by using analog components.

11. The statement from the Examiner quoted in Paragraph 10 is incorrect, in view of the state of the optical switching art as of the filing date of Application Serial Number 10/083,095. The device disclosed by Laughlin is not as described by the Examiner, for the following reasons:

12. The Laughlin patent teaches "a system and method for determining the condition of an optical signal." Laughlin, Col. 1, lines 8-9. Laughlin further states that its invention is "a system and method for determining the condition of an optical signal is provided that substantially eliminates or reduces disadvantages and problems associated with previous techniques." Laughlin, Col. 1, lines 33-36.

13. Laughlin teaches that the disclosed invention overcomes problems with devices that depend upon splitting an optical signal. Laughlin states: "Technical advantages of the present invention include a signal monitoring circuit that determines the condition of an optical signal in response to a reflection generated by the optical signal at an interface between a first refractive material and a second refractive material. Prior attempts to sample an optical signal required splitting the signal into a primary component and a secondary component. This technique attenuates the optical signal by at least the amount of the secondary component that is split off for sampling and may create additional insertion losses in the optical signal." Laughlin, Col. 1, line 66 to Col. 2, line 8.

14. Laughlin further teaches away from using his signal monitoring circuit **28** with switches using optical splitters with the statement: "An important advantage of the present invention is the ability to determine the condition of optical signal 30 based upon reflection signal **32**. Prior attempts to sample optical signal **30** require splitting optical signal **30** into a primary component and a secondary component for processing. This technique attenuates optical signal **30** by at least the amount of the secondary component and may introduce other insertion losses into signal **30**. By determining the condition of and the data communicated by optical signal **30** based

upon reflection signal **32**, the present invention reduces the attenuation of optical signal **30** in comparison to prior techniques." Laughlin, Col. 6, lines 57-67.

15. Laughlin does not provide any details regarding the signal monitoring circuit **28** other than to describe it functionally. For example, Laughlin states: "Signal monitoring circuit **28** comprises an appropriate combination and arrangement of optical, electrical, mechanical, or thermal devices that detect and process reflection signal **32** to determine the condition of optical signal **30**." Laughlin, Col. 3, lines 59-63. Further, Laughlin discloses that the signal monitoring circuit **28** includes a signal processing circuit **58** that "includes any number and arrangement of processing and memory devices to receive, amplify, condition, encode, modulate or otherwise process signal **60** using a variety of processing techniques." Laughlin, Col. 4, lines 21-24. Further, Laughlin discloses that the "[t]hreshold circuit **62** may comprise a resistor string, transistors, comparators, logic gates, or any suitable combination of analog or digital devices that receive monitoring signal **60** associated with reflection signal **32** and compare it with a threshold range defined by a lower threshold and an upper threshold." *Id.*, Col. 4, lines 28-32. Contrary to the assertion by the Examiner that "the analog selection circuit is an art-recognized equivalent of an digital selection circuit," Laughlin only states that the functions disclosed for his signal monitoring circuit **28** can be constructed in various ways, but Laughlin does not disclose specifics regarding the various ways. Accordingly, one skilled in the art would not recognize an analog selection circuit as an art-recognized equivalent of an digital selection circuit.

16. Accordingly, the above quotes shows that Laughlin teaches away from using the signal monitoring circuit **28** with an optical switch using optical splitters.

17. At Col. 8, lines 47-65, Laughlin discloses the operation of his invention:

> If threshold circuit **62a** determines that primary signal **30a** is present and suitable for use with optical switch **102**, control circuit **64** may or may not generate a control signal **66** depending upon the state of the optical switch. For example, if optical switch **102** currently communicates primary signal **30a** as output signal **104**, control circuit **64** may not generate control signal **66**. If optical switch **102** currently communicates protection signal **30b**

> as output signal **104**, control circuit **64** may generate a control signal **66** that toggles optical switch **102** so that it communicates primary signal **30a** as output signal **104**.
>
> If threshold circuit **62a** determines that primary signal **30a** is absent, attenuated, or otherwise degraded and threshold circuit **62b** determines that protection signal **30b** is present and suitable for use with optical switch **102**, control circuit **64** generates a control signal **66** that instructs optical switch **102** to toggle from primary signal **30a** to protection signal **30b** such that protection signal **30b** is communicated as output signal **104**.

18. Laughlin repeats the description of the operation of his device throughout the patent. However, the Laughlin patent does not disclose toggling the protection signal **30b** to the primary signal **30a** a specified time after the primary signal **30a** is restored to full operation. Accordingly, Laughlin does not disclose a timing circuit connected to a deselect circuit.

19. Examiner's Statement Regarding Claims 2 to 5, 8 to 10, and 12 to 13

20. I have reviewed the U.S. Patent and Trademark Office Action, Paper Number 02112004, which contains the following statement on pages 5-6 with respect to Claims 2 to 5:

> Regarding claim 2, Young does teach (see Figure 1) said analog selection circuit includes a timing circuit responsive to said primary optical signal; and a deselect circuit responsive to said timing circuit as described in column 1, lines 55-68 and column 2, lines 1-41, column 3, lines 1-68 and column 4, lines 1-21.
>
> Regarding claim 3, Young teaches that said timing circuit outputs a timing signal to said deselect circuit after a selected period in which said valid primary optical signal is present, said deselect circuit causes said optical switch to route said primary optical signal to an output of said optical switch upon receiving said timing signal as described in column 1, lines 55-68 and column 2, lines 1-41, column 3, lines 1-68 and column 4, lines 1-21.
>
> Regarding claim 4, Young teaches (see Figure 1) that said timing circuit includes a network including a resistor (22) and a capacitor (52) having a charging time defining a selected period before said primary optical signal is routed through said optical switch as described in column 3, lines 11-41.

> Regarding claim 5, Young teaches (see Figure 1) that said deselect circuit includes a network including a Schmitt trigger and a diode, said network causing said optical switch to route said primary optical signal upon actuation of said network by a timing signal from said timing circuit as described in column 3, lines 11-68 and column 4, lines 1-26.
>
> It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin in order to provide for a low standby delay circuit which is effectively independent of power supply fluctuations as described in column 1, lines 5-12.

21. I have reviewed the U.S. Patent and Trademark Office Action, Paper Number 02112004, which contains the following statement on page 8 with respect to Claim 8:

> In regard to claim 8, Young does teach (see Figure 1) a timing circuit responsive to said first splitter second output, said timing circuit including a resistor (22) and a capacitor (52) having a charging time defining a selected period, and a deselect circuit responsive to said timing circuit, said timing circuit outputting a timing signal to said deselect circuit after said selected period in which a signal indicating that said first splitter second output has a level greater than a selected value, said deselect circuit including a Schmitt trigger and a diode as described in column 1, lines 55-68 and column 2, lines 1-41, column 3, lines 1-68 and column 4, lines 1-21 and as shown in Figure 1.
>
> It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin in order to provide for a low standby delay circuit which is effectively independent of power supply fluctuations as described in column 1, lines 5-12.

22. I have reviewed the U.S. Patent and Trademark Office action, Paper Number 02112004, which contains the following statement on pages 10-11 with respect to Claims 9, 10, 12, and 13:

> In regard to claim 9, Young does teach (see Figure 1) said analog selection circuit including a timing circuit responsive to said primary optical signal, and a deselect circuit responsive to said timing signal, said timing circuit initiated by receiving a valid primary optical signal, said timing circuit outputting a timing signal to said deselect circuit after a selected period in which said valid primary optical signal is present as described in column 1, lines 55-68 and column 2, lines 1-41, column 3, lines 1-68 and column 4, lines 1-21.

In regard to claims 10 and 12, Young teaches (see Figure 1) that said timing circuit includes a network including a resistor (22) and a capacitor (52) having a charging time defining a selected period before said primary optical signal is routed through said optical switch as described in column 3, lines 11-41.

In regard to claim 13, Young does teach (see Figure 1) that said deselect circuit includes a network including a Schmitt trigger and a diode, said network causing said optical switch to route said primary optical signal upon actuation of said network by a timing signal from said timing circuit as described in column 3, lines 11-68 and column 4, lines 1-26.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin in order to provide for a low standby delay circuit which is effectively independent of power supply fluctuations as described in column 1, lines 5-12.

23. The statements from the Examiner quoted in Paragraphs 20, 21, and 22 are incorrect, in view of the state of the optical switching art as of the filing date of Application Serial Number 10/083,095. These statements have in common the assertion that Young teaches an analog selection circuit that includes a timing circuit and a deselect circuit. The device disclosed by Young is not as described by the Examiner, for the following reasons:

24. The Young patent teaches a digital delay circuit, which is not the same as an analog selection circuit. The delay circuit disclosed in Young produces "an output pulse having multiple-variable signal characteristics (leading and trailing edge timing and shape and pulse duration)." Young, Col. 56-59.

25. Young, in the "FIELD OF THE INVENTION" section in Col. 1, lines 6-8, states: "The present invention relates to signal processing circuits and is particularly directed to a low standby power **digital pulse delay circuit**." (emphasis added).

26. Young, in the "BACKGROUND OF THE INVENTION " section in Col. 1, lines 15-18, states: "Signal processing systems, especially **digital data processing systems**, commonly employ a reference time clock through which signal/data processing operations throughout the system are controlled. Because of a variety of factors that influence the timing of events within the system, such as the inherent throughput delay of individual circuit components, propagation delays of signal transmission links and processing cycle times, it is usually necessary to incorporate delay circuits in the system, thereby ensuring proper timing relationships among signal transitions." (emphasis added).

27. Further, Young states that "the source voltages for each arm of the comparator and those of voltage divider network are the two logic levels of the **digital signals being processed**." Young, Col. 2, lines 42-45 (emphasis added).

28. Also, Young states that "the comparator sections **91** and **92** and the reference threshold section **93** of Schmitt trigger circuit **61** are coupled across the same set of supply voltages that establish the **binary high and low levels of the digital signal processing system**, the delay circuit is not affected by voltage fluctuations." Young, Col. 10, lines 13-18 (emphasis added).

29. A person skilled in the art would recognize Young as disclosing a delay circuit used in digital circuits to precisely align timing signals. *See* Young, Col. 1, lines 15-25 ("Signal processing systems, especially digital data processing systems, commonly employ a reference time clock through which signal/data processing operations throughout the system are controlled. Because of a variety of factors that influence the timing of events within the system, such as the inherent throughput delay of individual circuit components, propagation delays of signal transmission links and processing cycle times, it is usually necessary to incorporate delay circuits in the system, thereby ensuring proper timing relationships among signal transitions.").

30. Accordingly, Young teaches a delay circuit for digital systems and does not teach an analog selection circuit.

31. Also, Young does not teach an analog selection circuit having a timing circuit and a selection circuit that is adaptable for switching an optical signal.

32. Contrary to the assertion of the Examiner quoted in Paragraph 20 that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin," it was not obvious to one having ordinary skill in the art at the time of filing of Application Serial Number 10/083,095 to use the delay circuit taught by Young as an analog selection circuit.

Respectfully submitted,

Reddy Urimindi

5/28/04

Date